

# Cardiovascular disease: The dietary fat debate continues but early tight control is beneficial



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The impact of lifestyle interventions on cardiovascular disease (CVD) risk was debated in June at the American Diabetes Association's 77<sup>th</sup> Scientific Sessions, both during presentations and in informal discussions with peers.

The “diet–heart hypothesis” states that partially replacing dietary saturated fats with unsaturated fats (vegetable oils rich in linoleic acid) will reduce serum cholesterol levels, particularly LDL-cholesterol. This reduction is proposed to result in decreased cholesterol deposition in arterial walls, reduced coronary artery disease rates and improved survival. Following Ancel Keys' Seven Countries study (Keys, 1970), which originally proposed a link between dietary fat intake and rates of CVD, a small number of randomised controlled trials were set up to test this hypothesis. There is debate as to whether it was the fat or the sugar content of the diets that correlated with CVD risk, and some of the findings of the studies set up to prove or refute the link have also been disputed.

In 2013, re-evaluation of the Sydney Heart Study to include previously missing data demonstrated that, despite reductions in LDL-cholesterol levels, there was an increased risk of CVD and all-cause death in the intervention group which replaced saturated fats with unsaturated fats and vegetable oils (Ramsden et al, 2013). Likewise, re-evaluation of recovered data from the Minnesota Coronary Experiment cast doubt on the validity of these early studies on which our guidance to reduce saturated fat is based (Ramsden et al, 2016). The low-fat diet explored in the Women's Health Initiative (Howard et al, 2006) demonstrated no difference in CVD risk despite a large number of participants. However, CVD was not the primary outcome. The study involved a low-fat diet, reducing not only saturated fat but also polyunsaturated fats, and some of this fat was replaced with increased carbohydrates. Both of these factors are likely to influence CVD risk. The

choice of nutrients used to replace calories from saturated fat is known to be important, and other studies have shown that there were no benefits and potential detriment when saturated fats were replaced by increased carbohydrates (Eckel et al, 2014), so the evidence is complex.

## AHA guidance

I anticipated that the recent publication of a presidential advisory from the American Heart Association (AHA; Sacks et al, 2017) would clarify the situation. This guidance continues to support the diet–heart hypothesis, stating that lowering intake of saturated fat can reduce CVD risk by as much as 30%: comparable to the effects of statin therapy. It recommends that the increase in unsaturated fats should focus on polyunsaturated fats (vegetable oils) rather than monounsaturated fats.

However, this guidance is supported with only four core randomised controlled trials looking at the relationship between diet and CVD risk, all initiated in the 1950s and 1960s, prior to widespread statin use and at a time when saturated fat intake was higher than today. Two of these trials actually failed to demonstrate significant reductions in coronary heart disease rates in those consuming increased levels of polyunsaturated fat (Medical Research Council, 1968; Dayton et al, 1969), although the studies contributed to a positive meta-analysis.

The guideline focuses largely on reductions in LDL-cholesterol rather than changes in overall lipid profiles as the surrogate marker for CVD risk, despite evidence that dietary fats have different effects on LDL than on other surrogates of interest, such as total:HDL-cholesterol ratio (Mensink et al, 2003). Surprisingly, only one short paragraph was included on dietary fish oils, the authors dismissing these because they “contribute little energy to the daily diet and do not pertain closely to the topic covered by the present advisory”. Instead, readers are referred to separate AHA guidance on fish oils and CVD.

## References

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The guidance includes a clear message that high intake of industrial *trans* unsaturated fat increases CVD risk. The authors remind us that ruminants also produce *trans* fats, which are therefore present in dairy foods and meat; however, these appear to have different effects to industrial *trans* fats in the human body and have not been associated with increased CVD risk and mortality.

So what can we tell people who ask for guidance on diet to reduce CVD risk? The AHA guidance supports the use of Mediterranean-style diets and the DASH (Dietary Approaches to Stop Hypertension) diet. Benefits of diets rich in monounsaturated fats versus polyunsaturated fats have been explored in other studies (Schwingshackl and Hoffman, 2012). Most would advocate oily fish intake, taking into account heavy metal toxicity. Optimising weight is helpful, so reducing sugar, sugar-sweetened beverages and high-glycaemic-index foods, understanding what works for the individual and signposting to other resources, such as dietetic colleagues, remain important.

The AHA presidential advisory is likely to generate renewed discussion that may help clarify the way forward. Schwingshackl and Hoffmann's (2012) systematic review and network meta-analysis is ongoing and will re-evaluate and compare the effects of low-carbohydrate, low-fat, vegetarian, high-protein, Mediterranean, DASH and low-glycaemic-index/load diets on glycaemic control and cardiovascular risk factors in people with type 2 diabetes.

### Support for benefits of tight early control on future CVD risk

Recently, a population-based study of nearly 25 000 records from the Danish national registry linked achieved HbA<sub>1c</sub> levels and HbA<sub>1c</sub> reductions in the first 6 months of metformin therapy to later risk of CVD (Svensson et al, 2017). Although a cohort study, it supported the findings of the UKPDS (UK Prospective Diabetes Study) that tight early control (as well as magnitude of HbA<sub>1c</sub> reduction) was associated with significant reductions in later CVD risk. In people aged 70 years and over, however, reductions of  $\geq 22$  mmol/mol (2.0%) were associated with an increased risk of CVD, suggesting a J-shaped curve similar to that postulated in the ACCORD (Action to Control Cardiovascular risk

in Diabetes) study (see page 106 of this issue of the Journal).

Using the Danish national registry ensured capture of the CVD data, and the quality of the data in this registry has been validated in previous studies. However, as we might observe in our own practices, only around 50% of those started on metformin had a repeat HbA<sub>1c</sub> within 6 months of initiation. Early follow-up, with HbA<sub>1c</sub> checks at 3 and 6 months after diagnosis, is now advocated by NICE, with intensification of therapy as soon as possible for those not meeting their agreed target.

### In this issue

This issue of the Journal includes an 8-page report sharing highlights from the American Diabetes Association conference. Delegates from the PCDS attended a smorgasbord of sessions relevant to primary care, and we have distilled out our key take-home messages. We hope this report will update readers on new data presented at the meeting and stimulate further reading and changes to practice. The PCDS would like to thank Janssen for their educational grant which made this report possible, and my thanks go to Nicki Milne, Colin Kenny, Martin Hadley-Brown and Helen Davies for their assistance in writing the report.

Elsewhere in the Journal, Jane Diggle continues our "How to" series with an algorithm for diagnosing and managing dyslipidaemia; we revisit the ACCORD studies in our "Studies that changed clinical practice" series; and, in our free CPD module, Joseph Henson and his team from Leicester explore pre-diabetes and diabetes prevention. Pam Dyson, Research Dietitian at the Oxford Centre for Diabetes, Endocrinology and Metabolism, discusses the pros and cons of different diets for weight reduction and glycaemic control; Samina Ali and colleagues share their grassroots diabetes education project from Glasgow; and Carol Edwards outlines the benefits of running an enhanced diabetes clinic in general practice in Leicestershire.

If you or a colleague would like to become more involved in the work of PCDS, please take a look at the call for nominations to join the committee on the facing page. Have a restful summer and see you in September. ■